

THE NEON NEWS

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IT'S A GAS, GAS, GAS

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'Hey
buddy,
you
gotta
do me a
favor...'

By Michael Blazek

I hadn't been in business in Seattle very long, so when this guy walked in the door with five neon patterns rolled up under his arm, introduced himself as Marty Mitchell, and said,

"Hey buddy, you gotta do me a favor," I listened to what he had to say.

We were already busy with a lot of neon wholesale work, but when he rolled out the patterns -- different hand-drawn patterns for hair-and-nail salons, beauty shops, cruises and other assorted work -- it looked pretty lucrative.

When he said he could pay us cash if we could hurry up and get them done, that sealed the deal. My other glass bender agreed to work that night to get the work done for him.

When the customer came back the next day to pick up the work we had frantically gotten done for him, he had another armful of patterns. Of the two signs we had finished, he only wanted to take one; he said the other jobs under his arm had "priority."

When we asked for the money for the job he didn't want to take, he said, "Don't worry about your money, honey -- I really socked it to these people on this one and I gotta get it out quickly; it's worth a lot of money."

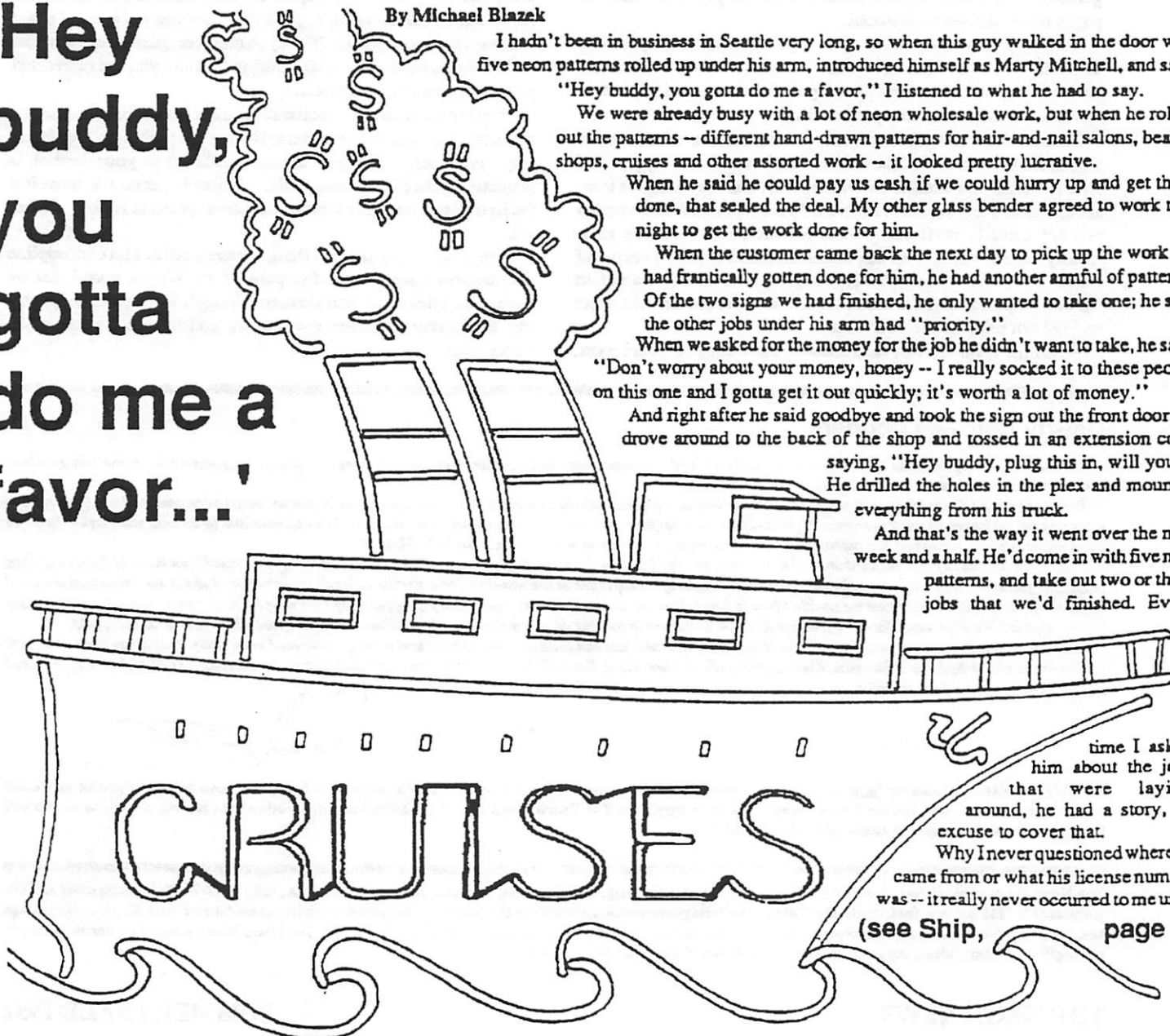
And right after he said goodbye and took the sign out the front door, he drove around to the back of the shop and tossed in an extension cord, saying, "Hey buddy, plug this in, will you?" He drilled the holes in the plex and mounted everything from his truck.

And that's the way it went over the next week and a half. He'd come in with five new patterns, and take out two or three jobs that we'd finished. Every

time I asked him about the jobs that were laying around, he had a story, an excuse to cover that.

Why I never questioned where he came from or what his license number was -- it really never occurred to me until

(see Ship, page 5)



CRUISES

Neon school accreditation is no "easy A"

<Editors' note: After Randall Caba noted (NN#10) that his Neon Art and Tube Bending School Inc. was accredited, we asked him to elaborate on what exactly that means. Gayle Young, financial aide administrator for the school in Portland OR, wrote this excellent response, which we have shortened slightly:->

Accreditation is a word which is tossed about to mean many different things; within the education field it is what each school desires. Accreditation is simply the okay from a registered agency of the federal government. ACCET, or the Accrediting Council for Continuing Education and Training, is a federally registered body which grants accreditation.

To obtain or maintain this accreditation is difficult. The first step is obtaining state licensure as a school. Then you must train students for one to two years, documenting completion and placement rates and maintaining accurate and consistent records.

Now you can apply for accreditation. Along with the initial application is a report containing every detail of how the school operates and the justification behind each action. This report is generally, for a small school, about 100 written pages and 200-300 pages of exhibit documentation.

This report isn't simple... in other words, you can't B.S. your way through it. A sample question: "Indicate the instructional methodology used and how teaching methods are used to produce active and positive student participation."

Once the report is finished, it is submitted to a committee of professionals who determine whether you have effectively justified your teaching and administrative methods, and they assign a team of experts in differing fields to "visit" your school and see whether you are actually performing what you have reported. The team usually consists of at least one communication expert, a couple of school owners from accredited schools, curriculum experts and, in our case, a professional from the field. These people are volunteers and are not paid for their services.

When the team arrives, each member has a copy of your report,

and each is assigned a different part of the report to concentrate on, ensuring that you are doing everything in the manner you described. They review ALL your financial data, student records, procedural policies and practices. They observe classes, asking the students how they think you are doing and where problems arise. They call your past students and their employers to estimate satisfaction. They call the state and city to check up on your record.

Generally, they ensure that you are doing all you say you are and that it stands within the guidelines of proper post-secondary education. Students must be satisfied, completing their programs with proper skills and finding gainful employment within the field. You must maintain accurate records and prove financial stability.

After the visit, which usually takes two or three days, the team writes their report of your strong and weak points and submits it to the original accrediting committee. The committee then reviews all materials and, if they are favorable, extends accreditation on a "trial" basis.

After the initial one-year trial accreditation, another team is scheduled to "visit" and report on their findings. If the second report shows maintenance of good practices you are granted a two-to-three-year accreditation. Then you must complete another report, and the cycle starts over again. During the time you are accredited, you are continually monitored.

Why is accreditation important? It ensures credibility. It enables students to have someone to run to if there are problems. It enforces good practices. It proves to the public that your school is maintaining the highest standards. It is also important because it is the first step in enabling your institution to provide federal student aid.

Accreditation is a difficult thing to gain; it takes a lot of discipline and requires a great deal of responsibility. We are proud that we have gained this honor and are maintaining it with pride. I hope that this effectively describes the process and instills a sense of its importance.

Dearly beloved benders,

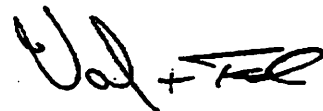
We were expecting this kind of trouble, and it finally arrived. Manufacturers and suppliers have been sending us some faxes (some polite, some snippy) about our -- and your -- notes on various products.

Prudence would dictate that we avoid this legal minefield, and simple fairness can take a lot of expensive legwork. But we want to continue to write (and publish what you write) based on our experience of product/supplier performance and the best info we have on prices. We will continue to discuss such issues because good materials are our bread and butter, and unreliable materials make us want to... to... SMASH GLASS!

This is our last issue from Amsterdam, and by the time you read this we'll be heading homeward. This summer Val "guest-edited" an issue of European Sign Magazine for which Ted made a road-ready neon bike -- with spinning tubes in the wheels -- for a story on 12-volt transformers (you'll see an uncensored and updated version next issue, 'cause we couldn't fit it in here). You can subscribe to colorful, glossy European Sign for only \$100 per year; see what a good deal Neon News is! We also thank former ES editor Karen Charlesworth for this issue's subtitle, and Matt Thompson for great illustrations on demand.

We may be home at the old phone number in November; 'till then you can send mail to Volcano and we'll get the word eventually. And if you have any good sign connections or buddies in Bangkok, Kuala Lumpur, Singapore, Hong Kong, Taipei or Tokyo -- give us a quick fax to Amsterdam (3120-626-2789). We need all the friends we can find, travelling cheaply with a two-year-old for two months...

Keep on writing,



P.S.: We're thinking of making Neon News T-shirts, selling them for around \$12 and offering them for less with subscriptions and resubs. If you're interested in getting one, let us know and we'll do a run when we know they'll go. The "neon" on each will be individually hand-inked with several colors, so no two will be alike. Then we'll be sure to know each other at NESA...

The Neon News is published quarterly by Val Crawford and Ted Pirrig, P.O. Box 668, Volcano, Hawaii, 96785 USA; (808) 967-7648. Subscriptions are \$16 per year U.S., \$18 per year for Canada, and \$20 per year for foreign subscribers, payable in U.S. currency. Single and back issues are \$4 each with \$2 per order postage and handling. No advertising is accepted, except for classifieds, available to subscribers only at \$.50 per word. The Neon News welcomes stories, artwork, photographs, letters, ideas, suggestions, irate comments and loads of free samples.

Shake and bake: How to mix, mill and use your own phosphor colors

By Ted Pirsig

(Based on an article by Dick Boonstra; translation by Roy Dusza)

All you North American readers may be wondering why we are taking space to explain European powder-coating techniques, when, after all, they are labor-intensive and therefore expensive.

Well, first of all, they're interesting. And in some situations you might find them worthwhile, or at least worth trying. Neon tubes made with the Phillips wet-powdering technique have some advantages: they won't stain, because there's no flame heating of the powder; the tubes are stronger, because they're oven-annealed; they can last longer, because there's no breakdown of powder when bending; and they can have a cleaner appearance (when viewed from the front).

And you can mix your own colors, which is especially exciting for anyone who feels limited by pre-coated tubing color choices.

I believe a small part of the American market would be willing to pay for this difference -- artists, say, who demand a certain look, or architects who say, "I don't want weld-splices in the middle of my straight lines."

While the wet-powder system is used in Europe exclusively with soda glass (and its famous sharp bends), it can of course be used with lead glass.

Dick Boonstra, who contributed a previous article on the subject, provided us with more written details. Then he invited me to his workshop in Rotterdam (where he mills dry powder solution for clients), and from there to other sign shops around Holland. Then I tracked down some American suppliers for the materials, so you could share in the fun.

MATERIALS:

The main investment in equipment would be for the baking oven (which could be made cheaper by someone with a bit of know-how) and for an assortment of powders or liquid solutions. The cost of the materials in production is not much; for 15mm glass one Dutch company estimates about 20 (US) cents per foot for colors like regular blue and white. Keep in mind too that there's no waste powder going into the trash (and the environment); you're only powdering the finished, bent tubes.

For mixing your own liquid solution from dry powder (much cheaper than buying it pre-mixed, and it gives you control over colors) the following are needed:

A 1.5 liter milling pot: A ceramic pot (available from lab and chemical supply houses) with a ceramic lid and rubber gasket (approx. \$275). The lid has a clamping device that seals it tight. With milling balls and formula inside it is placed on its side on the rolling machine, enabling a thorough mixing and grinding action.

Steatite milling balls: These are special ceramic spheres, sizes 15, 20 and 25 mm; you need enough to half-fill the milling pot. All three sizes are used to ensure that no regular spaces occur between the balls. Available from lab and chemical supply houses, from \$8-\$18 per pound.

Rolling machine: A pair of cylindrical rollers, one free-spinning and the other driven by a motor, with a variac to control the motor speed. Build it yourself for around \$100, or buy one for \$600. The optimum rolling speed for milling with a 1.5 liter milling pot is around 120 rpm.

It is easy to determine optimum speed by listening to the sound the balls make inside. They should be as loud as possible, because this means they are falling from the 12 o'clock position. If it's spinning too fast they will be held in place by centrifugal force and not fall at all; if too slow, they will fall too soon. Thus you can find the proper speed for any milling pot. The optimum rolling speed for previously-milled solution is 50 rpm.

Measuring scale: Commonly sold at Drug Enforcement Agency auctions; an O-Haus triple-beam-balance model should do the trick.

Viscosity meter: Optional device for checking the thickness of the mixed solution (price \$60; should be available through paint supply houses).

Containers (for finished solution): Hard polyethylene or pyrex; must be

chemical-resistant.

Chemicals:

-- **Binder:** (different from dry-powder binders). The formulas below are calculated for using the specific "B1" binder sold by De Blaecker (which is based on 100% thinners/50% glue, at a cost of 60 guilders (\$32) per liter); other binders may vary. Purchase this binder from De Blaecker or other suppliers listed.

-- **Dry phosphorescent powder:** Color of your choice. Preferably a 4-micron grind (special for wet solution), baked at 1,000 C and slightly sintered. (7 microns is normal for dry-powdering techniques. If you are doing dry-powdering as well, up to 20% of left-over same-color dry powder can be added to the mix. Also, if you are uncertain about the grain size of a powder you have, you can use a low-power microscope to check it -- there are slides available with a variety of reference lines on them, for you real fanatics.

Thinners:

-- **Spiritus ketonatus fortior:** For all powders; it's \$32/liter here.

-- **Amyl acetate (ameli acetate):** For all powders; around \$11/liter.

-- **Butyl acetate:** For washing the milling pot, and as optional thinner for light-colored powders; \$7/liter.

-- **Ethyl acetate:** Optional thinner for white-light powders; \$7/liter.

-- **Acetone, 99.99% pure:** This is the cheapest thinner, but needs to be replenished most often.

Notes on thinners: The formulas (see below) don't change if you use different thinners. Butyl or ethyl acetate are cheaper but you can use amyl acetate for all types of powders.

Spiritus fortior is more pure (and expensive) than the other thinners, and it evaporates much more slowly. If you don't like the evaporation rate with amyl acetate, you can make your next batch with spiritus fortior, or with a custom blend of the two for an in-between evaporation rate.

Ethyl acetate and acetone evaporate fastest.

STEPS:

There are two parts to the milling process: First mix the dry powder with thinner (4 hours), then add the binder and mill long enough (between 24 and 90 hours) to bring the grain down to the optimum size (2 microns).

1) Have a clean milling pot half-full of ceramic balls (all three sizes, in equal numbers).

2) Measure powder and add (see formula below).

3) Measure thinner and add.

4) Rotate four hours at the proper speed.

5) Add binder.

6) Rotate between 24 and 90 hours at the proper speed. Too little time and the grain size will be too large, and vice versa. This affects the light output of the finished tube; 2 microns gives you maximum output. Also, milling times that are too

(see Powder, page 6)

More trans-Atlantic tech tips

It's amusing to be American and listen to the Dutch argue among themselves about the merits of smaller transformer sizes. They say things like, "Ten thousand volts (the proposed new limit for Europe) is just too much; even 8,000 volts is too much." When I open my trap and say, "Back home some say 15,000 volts is too much," I get a look that's a mixture of pity and incomprehension.

Seen at De Graaf Glasblazerij in Ameide, Netherlands: a very handy tool for removing the occasional chips from the edge of a cut piece of glass. It consists of a threaded 8mm (or 1/4") bolt, period. Grab it by the head and run the threads crosswise to the chips; off they come.

In Athens I repeatedly saw a substance used to insulate the wire-to-electrode connection on window signs. Now, I'd like to think it was a special, moldable, high-voltage-approved compound, but it sure looked like chewing gum.

I think a person could do well repairing signs in Greece, if they could do it from a boat. There are a lot of signs in disrepair (and the ones that do work tend to be in need of a good cleaning). Perhaps an island-to-island below-deck neon shop...

One respected neon shop in Holland uses extremely long cool-down times between bombarding and back-filling, around 25 minutes, to make sure the electrode is completely cold and degassed.

At Janse Lichtreclame, one of the largest sign companies in Europe (and a very hard place to get a tour of; thank you Theo Kanters and Dick Boonstra) we saw extensive use of the Phillips suspension technique, combined with oven-pumping of all tubes. They also make their own electrodes (now *that's* a self-sufficient neon shop), using outside brands as well, but "For the absolute finest quality, such as the boats like the Fantasia, we use our own." (The Fantasia was the first of several neon cruise ships; a video was made about it.)

I asked Theo about the Fantasia job (he was project manager), how it went installing the neon, and he said that the wiring and such was not difficult (as compared to the boat's other systems) but on the first boat something like four kilometers of glass was broken by shipyard personnel (out of about 20 kilometers total). They learned to protect it better after that!

Dick Boonstra of Rotterdam gave us these gems:

1) To make "grow-lights" for your tomatoes, pump clear glass with a 50-50 mixture of helium and neon, at 1-2 torr filling pressure, and run it on a normal transformer.

2) When pumping tubing with a lot of moisture in it (humid shop, say) you can install a solenoid valve on the gas ballast inlet of your forepump, instead of its existing mechanical valve. This way when rough pumping you hit a switch and open the inlet to the gas ballast, allowing the moisture to pump right through rather than "making peanut butter of your oil." Then switch back for high

vacuum at the end of pumping. Or just wire it directly to the bombarder circuit, so that whenever you are bombarding the valve is open.

3) Many people think that the larger the electrode the better, in terms of tube quality. This isn't true -- an electrode shell has an optimum operating temperature of 160° celsius, and if it runs too hot or too cold the light output of the tube will be reduced. This is because if it is too hot it will develop a "hot spot" in the shell and slowly destroy the activator, and if too cold the free electrons must be "pushed" out of the material -- when properly sized the electrons come out easily.

4) Lots of people use old refrigerator air compressors to power their torches; you just need to make a glass trap in the air line to catch the oil, and also to change the compressor motor oil to one more suited for non-air-conditioner use.

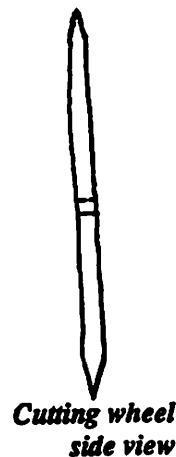
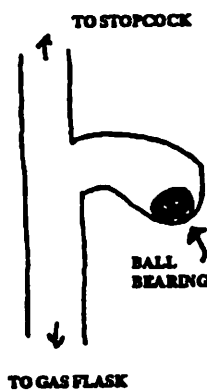
5) "An old trick from the Phillips boys is to clean the electrodes, right before pumping, with nitrogen. Just point your gas nozzle into the shell and run gas in for a few seconds. It'll eliminate any blue coming off of them after pumping. And one bottle of nitrogen will last you a lifetime."

Seen at both Janse and Van Moll Glasblazerij: a machine for quick-and-clean cutting of large-diameter glass tubing, easy to make and use.

Imagine a spinning grinder wheel whose leading edge is a fine point -- by touching the glass to this you both score it and then heat-stress the score in one quick move, the glass separating into two the moment it's touched to it.

At Janse they use a special diamond-edge wheel; at Van Moll it's simply an old saw blade (about four inches diameter) whose teeth are gone, the edge ground down to knife-blade angle (see drawing). In both cases the wheels were mounted in a miniature table-saw type base, the sharp edge of the wheel poking through and an on/off foot pedal down on the floor.

I was told that these are fairly common in the Netherlands.



Also seen at Van Moll: this "resting place" above the rare-gas flask. They use a ball bearing instead of a steel bar, and this way don't have it in the way when sealing on a new flask; no more "oops, I just cracked open the flask before it was sealed on."

At a tour of the Neon Products plant (Aachen, Germany) there was a tube with continuous snaking inside. To create the ongoing effect they'd put naphtha in it.

On the fourth floor of the Kathe Kollwitz museum in Berlin is a selection of pieces from the 1968 "Documenta" show, an international art showcase. Included is a 1968 neon piece by Chryssa, one of the first artists to use neon, for sale for only DM2,400 (about \$1600). And one of Belgium's biggest rock bands is "Neon Judgement."

(see Eurosupplies, page 12)

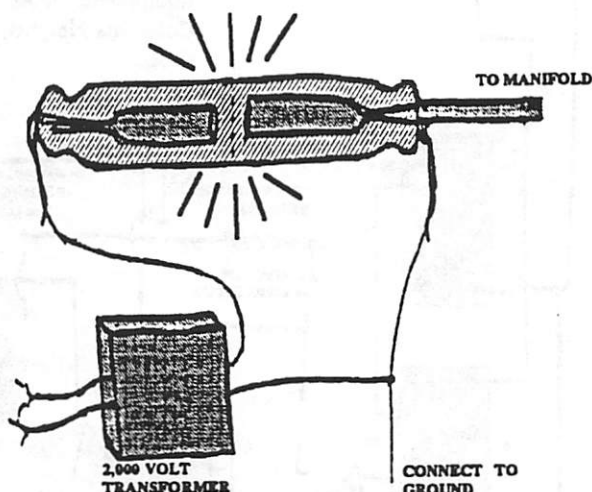
Tests for tight tubes

From Dick Boonstra:

Take an old rectifier tube (the kind with four plates inside), cut off the tubulation and attach it to your manifold. Connect 1000-1500 volts across two of the plates.

Now you have a leak detector, one that works where a normal spark tester cannot -- on leaky electrodes and on metal manifolds (both will deflect the spark to the metal, even if there is a hole present).

The normal color of the discharge (with a leak) is purple, but it will change to orange when liquid acetone is rubbed on the suspected leak. Also, according to Dick, this can double as a high-vacuum indicator, with no discharge at all across the plates at 10^{-6} torr.



Jeremy Storm of Volcano HI, hearing of this, built a somewhat different version, with these results: "I welded two 15mm shorty electrodes together (one tubulated) and then connected the tubulation on a side-tee to the manifold."

"After bombarding it, I placed a Tech 2000 3000-volt transformer on it and found it very useful for finding leaks! The acetone turns it white."

"Be sure and ground the one electrode if the transformer is connected during bombarding. And with this setup, it extinguishes at 30 microns of air."

(Ship, from page 1)

much later. There were enough jobs coming in the door that made it well worthwhile, and we just kept trying to finish the jobs on time and handle our other workload too.

He had one job that he designed that he really liked: a huge ship in water with a towering bow that said "cruises" underneath in three or four colors. It was obviously hand-drawn and was done quite well. He said he'd gotten a fair bit of money for it, and when he'd put it on the glass frame, he was only too keen to take it out the door.

Except -- and now the story changed a bit -- "Hey buddy, can you just lend me the sign and a tranny until I get the down payment from the owner?"

I was a little bit reticent to let him walk out the door with the sign and a transformer, but he'd given us a lot of business before, and the way he was selling signs, it looked like he was going to bring us a lot more.

Fortunately, within a couple hours he came back. Not only did he have more money (which he used to call "cabbage," because it was

"real green"); he had a story as well:

He said he went down to the store that he sold the sign to, and when the owner wasn't there to pay for the sign right then and there, he packed the sign back in his truck and drove down the road until he saw the next travel shop, took the sign in, lit it up, and sold it on the spot.

And he said, "I got more money for it than I quoted the last guy. Here's your money, honey. Great doin' business with ya!"

And so for the next week a new pattern developed, where he'd still come in with as many signs and as many jobs to do, but I always had to front him the sign and the transformers to get the job done. He'd come back with a few beers and hang around late, talking to us and telling us sales techniques, bragging how he was "the best damn cold salesman in the world."

Some of his techniques were worth remembering. He'd tell his customers that when McDonald's and Coke and the other large chains decided to put up a new store, the first thing they put up was their sign, and he always said, "There's a reason for that: Advertising sells, and that's been proven."

And he'd also say, "Do you have life insurance? Do you have health insurance? How about a little business insurance? That's what a sign is. For a dollar a day you can get business insurance, just to make sure you don't go out of business."

"And product recognition -- every time people drive by your store, they're gonna see that sign. They may not want a sandwich, or a picture frame, or a cruise right then, but when they're sitting at home thinking, 'Geez, I'd like to take a cruise,' they'll know exactly where you are, because they drive by your shop every day -- every day! -- and they see that cruise liner in there, and they get that visual recognition."

"And that's where you get the business. It's like a 24-hour advertising technique: it's in the window all the time, and it's always burning. You put an ad in the newspaper, and people may not even read the page that your ad is on. Put an ad on TV: thirty seconds. It gets a lot of people, but it's only there thirty seconds..."

He had another technique, where he'd walk in and say, "What do you sell the most of?" And when the person told him "pizza" or "beer" or whatever, he'd say, "And you don't have a sign that says 'pizza'?" That's the thing that makes you the most money. You gotta have that in the window so people know.

"You gotta keep that money turning over, you know; you got a lot of risks, you gotta have a lot of income if you wanna make a lot of money -- you gotta keep going, baby!"

He tended to sell a lot of beauty studios and hair-and-nail jobs too, because I think he found that women were much more willing to buy and use advertising as a medium, and I don't think he minded their company either. He was a good salesman, although he was a bit short and pudgy, and had gray curly hair and a moustache in kind of a ruddy face. He was a good salesman, and I'm sure he stirred up a bit of "business" in more than one category...

So it was one Friday when he talked me out of two signs -- another nice cruise liner, another sign and two transformers to go with them. He rang back up on Monday and said, "Hey buddy, I bet you thought I was going to take off on you, didn't ya?" I told him, kind of embarrassed, that he'd had me wondering. And he said, "Don't worry, I'll be there tomorrow."

And that was the last I heard of him personally.

But my new glassbender from Montana said his M.O. and physical description fit a guy from Billings who went by the name of Johnny Johnson, or some similar pseudonym. And when I called up my local supplier, they said they'd had a guy come in who owed them for a couple of transformers who left town -- he'd given them

(see Favor, page 13)

Build an electronic choke -- but be careful!

In keeping with the premise that "a little knowledge is a dangerous thing," we pass on this diagram for building a bombarder choke from Jeremy Storm of Volcano HI. (As always when tinkering with the bombarder bench, do not fool around with this stuff if you don't know how to handle a lot of electricity safely.)

Technically known as "saturable iron-core reactors," these devices give very smooth control. The theory is that by applying a variable DC voltage across one side of a transformer, it will allow the 240-volt current on the other side to flow in a varying amount. Two transformers are needed, one for each side of the AC cycle. Thus by dialing a variac knob you control the bombarder amperage.

That's the good news. The bad news is, this is an untested version. (We'd hoped to be able to test this, but as we have three chokes already, we'll wait for someone else's results.) The key question is, what is the ratio on the two step-down transformers?

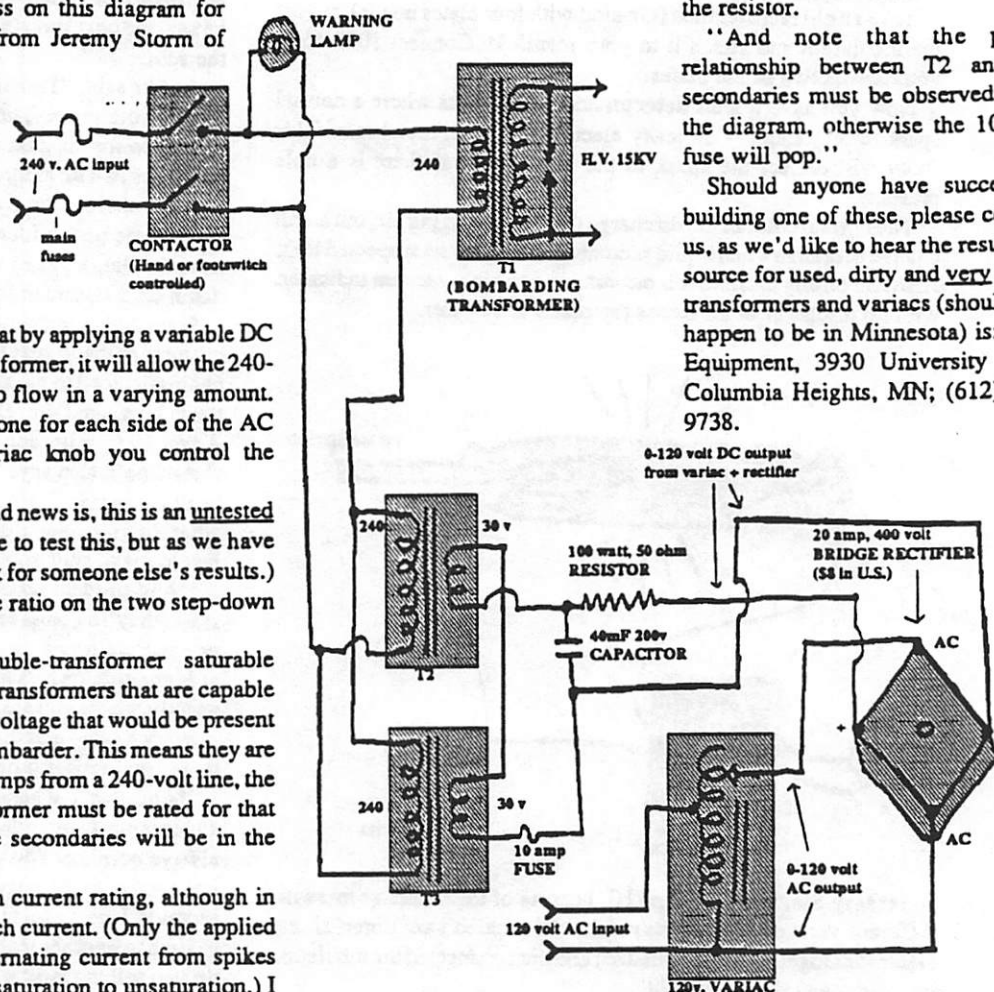
Jeremy writes, "The 'double-transformer saturable reactor' idea calls for a pair of transformers that are capable of handling all the current and voltage that would be present in the primary circuits of the bombarder. This means they are big. If the bombarder pulls 30 amps from a 240-volt line, the primary of each reactor/transformer must be rated for that amount! I'm guessing, but the secondaries will be in the range of 10 to 30 volts.

"They will have a very high current rating, although in this scheme there won't be much current. (Only the applied direct current plus a small alternating current from spikes caused during transition from saturation to unsaturation.) I suspect a fat resistor will be needed to ballast the DC source and protect the rectifier from the spikes. Again my guess is that a 50-ohm, 100-watt resistor would do; use four 100-watt

light bulbs in parallel if you can't find the resistor.

"And note that the phase relationship between T2 and T3 secondaries must be observed as in the diagram, otherwise the 10 amp fuse will pop."

Should anyone have success in building one of these, please contact us, as we'd like to hear the results. A source for used, dirty and very cheap transformers and variacs (should you happen to be in Minnesota) is: Root Equipment, 3930 University Ave., Columbia Heights, MN; (612) 788-9738.



(Powder, from page 3)

short result in a solution that's grainy and won't stay in suspension long enough -- it will settle quicker than you can use it.

7) Pour into a clean jar (ideally a large hard plastic jug with a wide mouth and a tight-sealing cap); wash the milling pot out with butyl acetate. The solution is now ready to use. While it is OK to store it on a shelf, it must be put on a rotator for at least two hours before use. The ideal speed for this is 50 rpm; many shops have a separate rotator just for the "in use" solutions, with enough space to have many jars rolling at once. Often they are on a timer, so at the start of the day the jars have already been rolling two hours.

For detailed instructions on using the solution, see last issue's article by Dick Boonstra.

FORMULAS:

To make a half-liter of solution, use these two formulas for calculating powder, thinner and binder.

$$Ph \times 3.6$$

$$T = \frac{\text{quantity of thinner}}{3 \times SG}$$

$$3 \times SG$$

$$Ph \times 1.8$$

$$B = \frac{\text{quantity of binder}}{3}$$

$$3$$

T = thinner (amyl acetate) in milliliters.

SG = specific gravity of the powder (indicated on the manufacturer's spec sheet).

Ph = phosphor in grams.

B = binder in milliliters (De Blaecker type P1)

Notes:

These formulas are based on a 1.5-liter milling pot correctly filled with balls -- after adding the binder (step 5) the balls are just below the surface of the solution (something that takes a little trial and error to perfect).

Type P1 binder is a specific binder sold by Dick Boonstra; other binders may require different ratios.

As the formula shows, the volume of the powder is more significant than the weight -- thus the use of the specific gravity as a factor.

An example with white powder: SG of powder is 1; ph of powder is 250 grams.

(see Bake, page 8)

On sweating & sales

By Joseph Keller

The other day while bending and pumping, I noticed my thermometer in my shop read 105°.

I usually make it a rule to shut the shop down and let the temperature cool down to, oh, let's say a comfortable 90 or so. Living in the deep South, the humidity level in the summer rarely goes below 45 to 50 percent, so the shop temperature could have been near 115.

Wanting to get finished, I ignored the heat and kept working. I pumped several tubes down and tipped them off wonderfully. They would have worked if I would have put gas in them. Some was classic glass, too.

I notice that, at least for me, I get careless in high heat, my work quality goes down and I get dangerous. Heat exhaustion has yet to take me, but I did carelessly neglect to hook one end of a bombarder lead to a piece one time, leaving it touching a piece of chicken wire to which my leg was very, very close. I decided then to set some guidelines for myself:

1. I have to have a thermometer at eye level and when it reaches 105, quit and take a break under the shade tree -- no exceptions.

2. I have to have a huge glass of water near me to sip on. I stay away from soft drinks; they just don't do the job that water does and caffeine and I don't get along while I bend glass. Don't drink beer while you bend. Alcohol will tend to dehydrate you and if you get a buzz, you may not realize it and get careless with the bombarder.

3. If you feel nauseated, get a headache, feel dizzy (no matter how slightly) or if anything else seems a little wrong on a hot day, **QUIT AND COOL OFF IMMEDIATELY!** These are some of the first signs of heat exhaustion and heat stroke.

Selling

What they don't usually teach you in neon school is how to sell. (Nor do technical schools, universities or public schools, for that matter.) Having worked as an interior designer and in retail, here are a few ways to push a sale through:

1. Knowledge of your product builds confidence. Have a sound comeback to every objection a customer may have.

2. Romance your product. Build your selling vocabulary with words like "rich, intense, saturated" and so on. Words like "nice, pretty, and bright" are flat, overused and hopelessly ambiguous.

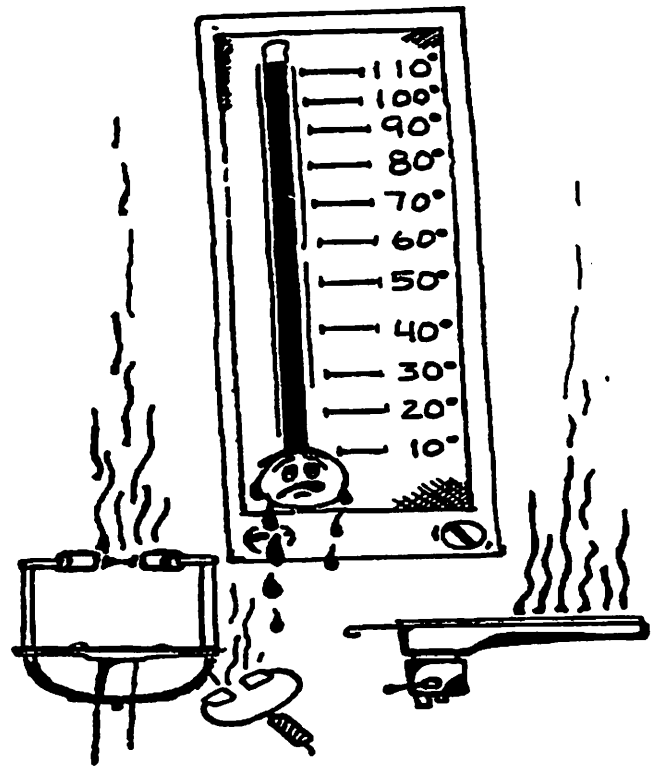
3. Tell them why they should buy a sign from you. Experience? Service? Design expertise? Variety? Price? If you told me you were "good," I would smile and thank you politely before going to my phone book and calling your competition. Why are you good? What exactly defines good? Be specific!

4. When you call on a customer, be professional. Don't go in looking like a bum. Look neat, clean, tidy. The image that you project reflects on your company. You may not be required to wear a suit, but a customer is more receptive when you look like you know what you're talking about.

5. Finally, speak clearly, directly, and confidently. Look them in the eye. At that moment, that customer is the most important person in the world. They have chosen to talk with you and you should be honored that they didn't pick your competition. They are doing you a favor, not vice versa!

My color board is invaluable. I don't know what other companies do without one. Make one, because the second you light it up, the customer's eyes light up.

Question: "As a customer, why should I spend an extra \$150 on



this sign for classic glass?"

Answer #1 (without color chart): "Well, the color's a lot redder and prettier than plain glass tubing and it lasts a long time so you get your money's worth."

Answer #2 (with color board): "As you can see, the classic ruby has a deeper, more saturated hue. The cost is a little more but the distinction that it would make from other signs would be striking."

"After all, since neon can easily last a minimum of twenty years, shouldn't you consider spending a little more initially to get something that you are truly happy with?"

"Do you know the sign on XXX Street? That's one of my prized children. Can I work you up something that would be uniquely suited to your business, and show it to you so that you would know exactly what you are getting?"

"I leave no surprises; you know exactly what you're getting, the colors you're getting, and you can make sure that I will stand behind my product. And if I don't catch a problem first, just give me a call and I will fix it."

What you have here is confidence, the customer being told exactly what they need, why they need it from you, and they know you're going to look out for them because they feel like an important client.

Take time with the customer, never rush, and for heaven's sake, SMILE! You are happy to be there. Believe me, for the customers that have not bought from me, they have recommended me to others who have. A good name is the most valuable selling tool of all!

Spark an arc

<From a later letter:> ...And what would a mad scientist be without his little travelling arc device that has really no function but looks really cool?

The first thing I did after I found out that electricity would arc violently between two high-voltage leads (don't ask what it did to my eyebrows; the doctor said the twitch will go away eventually)

(see Spark an arc, page 8)

(Spark an arc, from page 7)

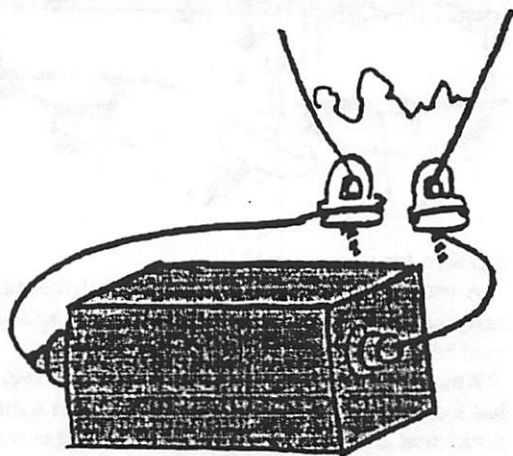
was to build one of these little things to amaze friends and family. Actually, "amaze" is not the word; panic, hysteria, chaos, weeping, wailing, gnashing of teeth as the thoughts of me burning down their houses set into their heads.

In retrospect, my first model was set into a cardboard box, which wasn't such a good idea. It worked, but 12,000 volts and paper products just don't get along.

What you'll need is: a dripping, black, old, evil-looking 12,000/30 transformer (for the full effect, nothing else will do), some GTO, two lengths of thick solid copper wire (make sure that it can stand up by itself) about 16 inches each, two ceramic insulators and a little warped imagination.

Really, it's pretty simple: Solder the GTO to the copper wire and wrap it around the insulator. That's all there is to one.

The insulators I use are used for electric fencing (which, by the way, has neither the bouquet of burning hair and flesh nor the



delightful numbing that lasts for hours after a direct hit that a neon transformer does).

You could make a box for it, leave it open, make a tower, whatever makes you happy. But please do remember that this is capable of producing a wicked shock or burn, and if the wires are enclosed in glass, so much the better. And don't come crying to me if it busts you good (my mother's saying).

You may have to experiment with the spacing of the wires, from an inch at the bottom to three or four inches at the top. If it arcs continuously in one spot (usually the bottom), move the wires away from each other until you see travelling. If you want the arc to travel higher, push the wires closer near the top.

(Bake, from page 6)

$$250 \times 3.6$$

$$T = \frac{\quad}{\quad} = 300 \text{ ml thinner}$$

$$-3 \times 1$$

$$250 \times 1.8$$

$$B = \frac{\quad}{3} = 150 \text{ ml binder}$$

Therefore combine the 250 grams of powder with 300 ml thinner in steps 2 and 3 above; add 150 ml binder in step 5 above.

For smaller-diameter tubes (10- or 12mm), a somewhat thinner solution is preferable to the formula given above.

Don't try to make too much solution for a given amount of

powder, however. While you can get greater footage out of it this way, you will get less light output and there's a greater likelihood it will "burn black," with the mercury creeping under the powder and getting next to the glass wall.

If the suspension solution has become too viscous, for example if you forget to put the lid on the jar, you can add thinner to dilute it to the original viscosity, which should be between 8 and 10 Zahnseconds (a measure of viscosity). This compares to the much thicker 16 to 19 Zahnseconds used in suspension solutions for precoat tubes. (If you do wish to precoat your own tubes with this, one trick to make the coating even is to control the rate that the solution leaves the tube.)

With amyl acetate or spiritus fortior solutions it is hardly necessary to thin; with ethyl acetate- or butyl acetate-based solutions you must add thinner more often.

Some typical powder weights: Standard blue = .85/9; brilliant blue = 1.1/1.15; all whites = 1; green = 1; all tri-phosphates are over 1 most of the time, around 1.1/1.15.

Keep in mind too that these powders are very hygroscopic (water-attracting) once baked into a tube - as are precoat tubes, for that matter. So it is best to bake only what you can pump soon. Otherwise water vapor can harm the coating, as well as make the tube much more difficult to pump (at 2 millibars, one cc of water becomes 675 liters of vapor).

For production mixing of powders, a number of milling pots is recommended; the thorough cleaning between batches that is otherwise required is "not a nice job," Dick says. De Blaecker uses one pot for all blues, one for green, one for orange and pink, and one for all whites. The steatite milling balls are relatively cheap; they have one set for every color.

If you're doing a number of colors with only one milling pot, you can use these colors, in this sequence, with only a minimum solvent rinse of the milling pot and balls (A difference of 50 kelvin in a color is invisible to the eye): Blue, light blue, intense blue, whites (going from highest to lowest kelvin color, i.e. 8300, 6500, 4500, etc.), pale pink, argon pink. With other colors you need a thorough solvent wash between batches.

MORE ON OVENS:

An ideal baking oven has an electronic temperature control, such as used those in fancy kilns and in the annealing lehrs used in hot-glass work, but this is not absolutely necessary. An exhaust fan is needed to vent the fumes during baking.

The beautiful custom-built model we saw at De Graaf Glasblazerij (Ameide, Netherlands) was 8x3x3 feet ("capable of handling 99% of all work"), with fully automatic temperature control, a hinged and counterbalanced lid, and a sleek exhaust system. Cost: 18,000 guilders (\$9,500). This oven can anneal pyrex; it could have been a bit cheaper without this feature.

For an oven of this size, capable of baking many tubes at once, the power consumed is in the range of 12,000 watts.

When building an oven it's important to buy firebricks that are all from the same lot, otherwise cold spots can develop in the oven and produce dark bands in the finished neon.

The rods that the glass is placed on must be of porcelain or other "oven furniture" material used in kiln firing. Never use metal, or you'll have uneven heating so bad it can jar powder loose.

There must be a space of at least 8" between the bottom of the oven and the "electrode stand" (the open ends of the tube where the electrodes will go). With 90-degree electrode stands, the rising heat of the oven can suck automatically through the tube.

(continued on next page)

(continued from previous page)...

The normal oven maximum temperature is 450° celsius. In use the oven will heat up in about 75 minutes; at 400°-420° the exhaust fan is turned on for ten minutes to vent the burning-out nitrocellulose fumes.

The heating then continues to 450° and is held there for 30 minutes, and after that a very slow cooling, about one degree per minute (7 hours total).

In a new oven the system can be tested by placing a piece of clear glass in with the powdered tubes. Check it when done to see if any nitrocellulose fumes condensed onto it; there shouldn't be any.

Oven-baking the glass also anneals it nearly perfectly, resulting in it being three times(!) stronger.

Here's a partial list of North American suppliers for do-it-yourself powdering:

Sylvania Phosphors and Chemicals
GTE Products Corp.
Chemical and Metallurgical Division
Hawes St., Towanda PA 18848
(717) 265-1431; (fax) x265-1492
Robert Stevens, sales manager

Sylvania has a large array of dry phosphor powders, although "We no longer list many of the phosphor blends in our current brochure, due to a decline in customer interest over the past several years, but the blends are still available." They have a minimum order of \$200 per item; request a copy of the older brochure if you're interested in the blends as well.

Sylvania also has two good technical bulletins worth requesting, "The preparation of lacquer suspensions of fluorescent powders," and "Sign-tubing lacquer preparation."

Tecnolux Inc.
5716 Third Ave.
Brooklyn NY 11220
(718) 439-1222; (fax) x439-0497

Any of the Tecnolux powders can be specially ordered in dry-powder form; however no stocks of these are kept at the Brooklyn branch.

EGL Co. Inc.
730 S. 13th St.
Newark NJ 07103
(201) 824-2200; (fax) x642-0479

EGL has "cold coat" solutions available in every color that they offer in precoated tubing; these are a no-bake alcohol-base solution. EGL's Kevin Rourke points out that one problem they have with these is shipping: Due to new regulations the solutions' flammability makes it quite expensive, in the range of \$50 for a single 500cc bottle.

Voltarc Tubes Inc.
176 Linwood Ave., Box 688
Fairfield CT 06430
(203) 255-2633; (fax) x259-1194

Voltarc has a "No-bake fluorescent coating mix" (presumably an alcohol-based solution). 1989 prices are around \$30 to \$40 per 500cc bottle. (See above for restrictions on shipping.)

Binders:

Raffi and Swanson
Wilmington MA 01887
(508) 658-3364 (fax) x658-3366

Raffi and Swanson are listed in the Sylvania literature as carrying pre-mixed binders.

Misc.:

Finally, one representative from a tube-coating company expressed concern about the solvents used; he said he thought OSHA would come down hard on any attempts by American sign-makers to move in this direction.

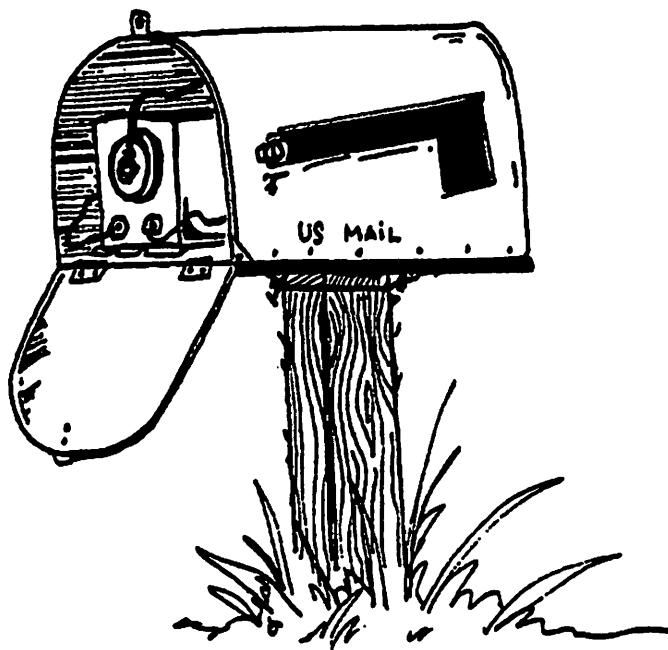
He also predicted that the Netherlands will eventually ban these solvents, as the cost of equipment to properly recycle them is prohibitive for all but the largest shops, and small companies now just pour them down the sink (or allow them to evaporate into the air).

So one aspect of using these techniques in the U.S. would be to explore which solvent is the least environmentally damaging.

Have you ever...

- ...lied to a customer?
- ...told a customer to squint (so as to fix the not-so-straight copy)?
- ...strangled a customer with a length of GTO and left him or her in the ceiling to rot?
- ...exploded your manifold into trillions of pieces?
- ...replaced a PBKM with a Swiss army knife because the other guy left all the tools in the shop?
- ...fabricated the wrong-size borders and installed them anyway with the reason being "it's art"?
- ...forgotten tools or miscellaneous materials at a job site knowing that the beautiful barmaid would have to call you and tell you of your mishap?
- ...put an outdoor transformer in a metal mailbox to conform to the rules of mechanics and aesthetics?
- ...filled up a cardboard box with excess units and dropped it from a single-story roof?
- ...reversed an already reversed pattern and bent the glass?
- ...relocated mercury stains on the job site with a hair dryer?
- ...forgotten to heat the glass before attempting to bend it?
- ...forgotten to cork the tube end?
- ...removed a ceiling tile on one end of a store and had the rest of the ceiling conform to the laws of gravity?
- ...glued tiles back together with a hot glue gun?
- ...purchased a BB gun?
- ...worked above the ceiling line in one part of a store and noticed the rest of the store was a tanning salon with only five sides to a booth?
- ...bombarded ten, yes, ten units at one time? (successfully?)
- ...given a friend a 12,000/60 to hold while you were on the phone and trying to find out which cord belonged to the radio and which cord belonged to the 12,000/60?
- ...heard anyone scream so loud before?
- ...sprayed over the new paint on the ceiling with flaming kerosene?
- ...seen sheep in your glass shop?

-- Dr. Argon



Necessities you didn't know you needed

In the last Neon News we asked for a good blowhose swivel, and received a fine sample in the mail: It has double swivelling (yes!), it's smooth spinning (yes!) and it doesn't leak. Plus it's offset at a 45° angle, not the usual 90°, which works well for keeping the blowhose out of the way. It's \$10 and available from Daco Neon Equipment, P.O. Box 281084, Papillion NE 68128; (402) 331-2164, (fax) x331-8259.

They make these themselves, and president Len Pallas writes, "We have experienced less than 2% failure rate, which is not good, but at this time seems like the best out there. Daco will replace any defective swivel up to one year."

Joe Augusta also wrote to recommend those sold by Wale Apparatus Co. in Pennsylvania; call (215) 838-7047.

(Now then, any suggestions for that little-piece-of-something that connects the swivel to various sizes of glass? Over the years I've used 1) tapered electrical connectors, which leak or slip off; 2) rubber hose, which sharp glass will shred into tiny pieces that, when bombarded, turn into lovely dark spots; 3) thick latex tubing, which works pretty well but when old will also shred; 4) rubber corks with a hole in the middle, good for 12mm & larger glass.)

And what about glass markers? The "china markers" (paper-wrapped waxy crayon) I left neon school with burn off in the flame, leaving one with no marks to see by and a mess of (toxic?) smoke. So I use soapstone, available at welding supply companies, but it's hard to find the "thin-line" type, and when you do, it breaks easily. The thicker, "normal" soapstone works well but needs to be sharpened on a bench sander pretty often, making a yuck-o dust cloud. Plus soapstone can be hard to wipe off of finished glass.

Alan Geoffrey (Sint Maartensdijk, NL) showed me a pen that marks glass PERMANENTLY. It was a metallic paint pen, the kind commonly available at office, art and hobby supply stores in gold or silver. When the marked glass is put into a flame, the ink turns deep grey, then glows bright red (a very impressive sight). No amount of flame will burn it off, nor will a razor or sandpaper take it off the cold glass afterwards. However, you *must* burn it on, or it will come off just by rubbing. If only heated by bombarding it will turn black but still come off with a bit of work.

The pens have a nice fine point, but be aware that the ink fumes are unhealthy, the paint is toxic and the pens dry out easily (keep that cap on). And if you start doing strange things like making continuous lines the length of the tube, you may get buzzing, arcing or worse later on.

An old find in a new bottle: When Neon Products (Germany) shifted its electrode production to Brazil, they stopped buying metal electrode shells from their regular supplier. This former supplier of shells is now producing their own electrode, called the Almon Germanrode. It is being distributed in the U.S. exclusively by:

Highland International Inc.
12829 Industrial Park Blvd.
Plymouth MN 55441
(612) 557-7002; Fax: x7014
Call for brochure and prices.

A Dutch friend recommended this supplier of laboratory equipment, including vacuum pumps:

Cole-Parmer Instrument Co.
7425 N. Oak Park Ave.

Chicago IL 60648
In U.S.: (800) 323-4340
Outside U.S.: (708) 647-7600
Fax: (708) 647-9600

Their catalogue is huge; as with most lab suppliers, the items of interest to neon folks are limited but fascinating.

A device for animation and other electronic control of neon is the "Sysmac Mini SP10" made by Omron, 1 E. Commerce Dr., Schaumburg IL 60173; (708) 843-7900; (fax) x843-8568. The literature I saw indicates a sophisticated modular control system that can be built upon endlessly.

Tecnolux wrote to inform us that they have additional new colors available; personally, I join the raving fans who find the glass easy to bend, hard to stress-crack and with powders that look good on tight bends.

Tecnolux Inc.
5716 Third Avenue
Brooklyn NY 11220
Tel: (718) 439-1222
Fax: (718) 439-0497

Meanwhile, mad scientist Joseph Keller in Northport AL went gaga over EGL's new machine-drawn classic "Accuwall" glass: "These tubes are rich in color and with a few new colors like bromo purple, aquamarine and tangerine, I wouldn't have even minded if they were that paper-thin-to-double-wall-thickness-in-the-same-tube stuff..."

"The uncoated ruby was almost opaque, but still beautiful. The bromo purple is a deep red-purple that doesn't even favor the regular purple-coated tubing, a very rich color. Aquamarine is equally beautiful, and it has a great afterglow after you turn the transformer off! Orange looked a lot like neo-ruby or classic coated ruby pumped neon.

"The only trouble is -- I can't find anyone who stocks the stuff! Has anyone got the name of a good EGL supplier who will let you buy this glass by the pound?"

<Someone correct me if I'm wrong, but I believe that throughout the world there is only one country producing machine-drawn colored glass: Italy. I've heard that it's either one or two companies on the island of Murano. They sell to Masonlite, Tecnolux, Glostertube, Neon Products and now EGL, who each coat it with their own powders and market it...>

Keller also raves that "Actown transformers are indeed a dream come true. They have a 3-9000/25ma transformer that for \$35 is a steal.

"With variable voltage so you don't have to keep 10 different sizes in stock, choking feature so you can't overload it, compact size, reliability, no drip operation, very bright (looks as bright as a 30 ma if not somewhat brighter), good service, pull-chain on/off switch, you can install near metal with no capacitor effects and they've got a great price too.

"I asked them and they said it has to do with magnets but I've put two of my own through the wringer, from burning in tubes to riding with me on calls, and I have been totally pleased.

"Call them at 800-531-NEON. By the way, these are core and coil, they are a little smaller than regular transformers but not much.

(see Supply, page 12)

Dumpster diving, drawing and designing

By Edward DeZuzio

I have a story to share with you. The names have been changed to keep the guilty out of jail.

It was a hot and humid Saturday afternoon, not much different from other days on the freeways. Shopping frenzy tied up the roadways and left the souls upon them helpless. "Noen" was part of this congestion, but it didn't matter much. Noen, a retired sign groupie from earlier in the century, receives no salary for the work he does, but he is involved in refuse transferal services, and answers to a force much greater than we mere mortals dare to imagine.

Noen travels extensively into and within 30-cubic-yard dumpsters. His biggest stomping grounds are behind shopping malls, where he finds many treasures that are refuse to other humans. Among these treasures are rare and intact luminous tube signs, transformers and related products. Noen has uncovered neon shoes, clothing, desks, chairs, benches, shelving and many other items that appear on the "don't make this out of neon in my class" list. Noen has expressed his desire to save these items and allows me first dibs on them. (There is always room for stainless steel channel letters and transformers.)

Noen's venture to his site of hidden treasures on the hot and humid afternoon revealed a plastic box with luminous tubing inside, all intact but one unit sputtering so badly that the trodes were held intact only by their heat-shrink insulation.

Noen knew that this was no biggie with the piggy and could be brought back to light with a little TLC. He climbed out of the deep, dark, and rudely perfumed dumpster; he pulled the day-old french fries from his ears and threw them on the gardened grounds for the birds to enjoy.

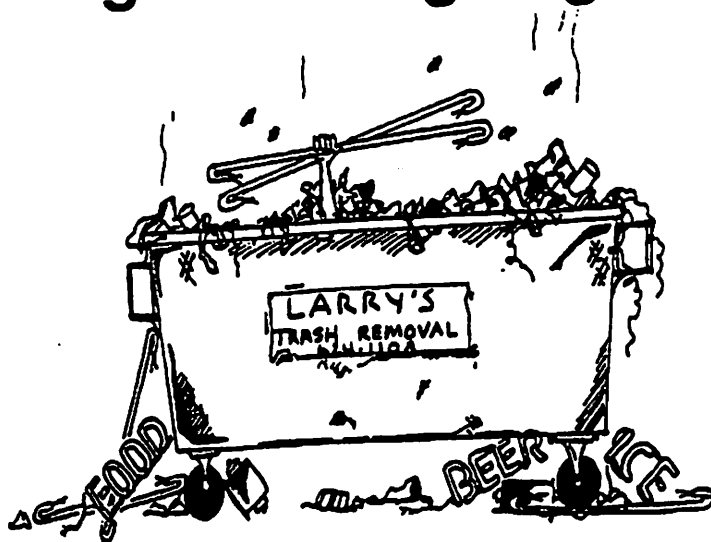
It was back to the world of non-stop stops on the overcrowded roads, full of poor souls pulling out into whatever voids occasionally came their way, never thinking of the lives or limbs of motorcyclists with whom they share the roads. As Noen sat in this traffic, humming a little ditty, the hair on the back of his neck stood up. He could feel it coming; yes, he was sure of it. The strength of the void is unmistakable, but it is not to be approached carelessly.

Going on a gut feeling, Noen cut his wheels to the right and smoked his tires into the void. This felt natural to Noen and he went on with the spirit of the road in his heart and colorful red flashing lights in his rear-view mirror. At first Noen thought nothing of the lights: "It's probably the rush of blood to my eyeballs from taking up with the void," he thought casually. It was only when he approached the town line that he realized it was the void patrol.

The void officer approached Noen with charisma that would have left Cary Grant jealous. The detective asked for the necessary paperwork and pointed out that it would take hours to extinguish the flames left by Noen's vehicle. Noen advised the detective that he needed to be at our shop by 1 p.m. because he had his heart set on repairing the neon he had in his car. The detective asked to see the piece that was responsible for this incident in the first place.

The officer of the void was happy to see that the piece in question read "Lee," and mentioned that his very best friend in the world went by the same name. The red-flashing-lights man inquired about a purchase price, and Noen mentioned that it would be extremely reasonable. The detective handed Noen his card, along with a warning about the dangers of the great, unmistakable void...

<From another letter:> ...Here we go, from two minutes a bend to two minutes a letter! I wonder if They Inc. has neon typewriter ribbon? Been real busy with everything except glasswork. To date it has been a little scary...



Well, what do you know, I just this second got back from an appointment yielding 510 feet of channel letter tubing. I'm going to try this typing stuff more often. Of course I need not tell you that Murphy's Law will bring about three-H weather (hazy, hot, humid) with such a job...

You inquired about projects and design in your postcard. I'm going to try and get this duck-billed platypus to play racquetball after the third full moon following the summer solstice. NO, NO, NO, that's not what I wanted to write...

When it comes to design I take the first thought that comes to mind and place it in a projector. I had a request for a fish with copy reading "fresh." Frank, the proprietor of the store, seemed comical to me, although I don't know him; one may think it rude to make such a judgement, but if it causes no harm and stays within your own thoughts and it is a positive approach, I think it's OK.

Anyway, even if it's not OK, I saw a fish with a hat. He was a fish who stood proud with his hat. I met Frank at his store and showed him the sketch; he loved it as he wears a hat when he goes out on the ocean.

The sign he wanted, though, matched his logo. Oh well, maybe the next seafood store will want the spontaneous hatted fish...

Being spontaneous is important. If it's not your practice to make sketches for the hell of it, then let the customer do it. Granted, you may end up looking at a fish that looks like a duck-billed platypus, but it is a start.

What is the biggest difference between all the tanning salons and bagel shops that all want pink-and-purple neon? The owners of such establishments. If there is copy, then let the owners write it out in their own hand.

Sometimes you don't have to clean it up at all. When you take the handwritten copy and put it in the projector, you may find it has a perfect balance of up-and-down gobbledygoop, setting it apart from the store down the street. If it isn't readable on the larger scale, try a pencil and eraser in spots.

This approach may go over well, but it may also cost you three sheets of fax paper because the owner's Aunt Susan in Fox, Alaska, has the nicest handwriting in the world...

One nice thing about going to see your customer with a sketch is that it shows your interest. Info on permits is great too. Yes, permits. Find yourself a lawyer who wears jeans and an earring outside of the office and talk to him or her about permits.

The important thing is that the lawyer speak your language. I've run into feelings of confusion with lawyers; sometimes I feel like I
(see Edward, page 13)

(Eurosupplies, from page 4)

A popular manufacturer of torches and related equipment, for both neon (Euro-style torches) and scientific glass work is:

Herbert Arnold GmbH & Co. KG

6290 Weilburg/Lahn

Weilstrasse 6, Postfach 1220

GERMANY

Tel: (06471) 2061; Fax: (06471) 2065

Their catalogue is in English, French and German; the sheer quantity of different torches is awesome; and of special interest are the (mechanical-valve-type) foot pedals for on/off flame control, with screw adjusters to maintain a pilot light at the torch.

They have both two-line and three-line models; at Alles Neon in Berlin I saw the three-line model demonstrated on an gas-air-oxygen bench burner (standard European type) and it worked beautifully, going from a tiny pilot flame to full roar and back smoothly. These also have a "stay-on" lever for continuous flame.

Guido, proprietor of Alles Neon, said his oxygen bottle lasted three months with the foot pedal, even when very busy (as contrasted with a Dutch glassblower I know whose bottles last a few days -- in his case we calculated that one of these (\$300) foot pedals would pay for itself within two months.)

A (formerly) East German company offering torches, foot pedals and other items similar to those available from Herbert Arnold:

Ilmenauer Glasmaschinenbau GmbH

Langewiesener Strasse 16

0-6300 Ilmenau

GERMANY

Tel: 511 Ilmenau; fax 72302

Their catalogue is in German only, with line-drawings (no photos) of the items. They also carry tools and materials for doing ornamental glass.

Also out of Germany is

B+C Glastechnische Maschinenbau- und Vertriebs-GmbH

P.O. Box 5610

D-6300 Giessen/Lahn

GERMANY

(0641) 82009; fax x84204

This is a supply house for both neon and scientific glasswork; as such they carry everything from torches to glass lathes to annealing furnaces. They too carry the foot pedals (described above) though only in the two-line model; their English catalogue shows a wide variety of Euro-style bench burners and hand torches, as well as smaller neon supplies like glass files, didymium eyeglasses and glassworking tweezers.

Recently an Alcatel catalogue passed our way: It is chock-full of high-vacuum equipment, from a wide range of forepumps and high-vacuum pumps to gauges and NW-KF connectors.

Two particular items caught my eye. First, their molecular drag pumps (a new type of high-vacuum pump they developed) are "a cost-effective alternative to turbomolecular pumps" (though still in the four-figure price range).

And, concerning their oil diffusion pumps, they write that "Studies in our laboratories have indicated that backstreaming in Alcatel diffusion pumps is of approximately the same magnitude as backstreaming in a conventional turbomolecular pump with lubricated bearings."

Alcatel CIT

Vacuum Technology Division, Export Department

55, rue Edgar Quinet - BP 201

92240 Malakoff FRANCE

Tel: 331 4092-3000

Fax: 331 4092-0450

They have a number of subsidiary companies as well as distributors around the world; here is one of the U.S. subsidiaries:

Alcatel Vacuum Products

40, Pondpark Road

South Shore Park

Hingham MA 02043

Tel: (617) 749-8710

Fax: (617) 749-8660

Is your map wheel looking a bit worn, tattered at the edges, sticking on the curves and generally being an inaccurate pain in the bun? Check out the "Run-Mate high-tech curvimeter," pricey (\$90-ish) but a very fine tool.

This is a battery-powered fat-pen-sized digital-readout map wheel, with readout in centimeters, kilometers, inches, feet or miles(!). No matter which direction you roll it, it counts forward, so no more twisted wrist or "oops, which way am I rolling this thing" consternation. It has a built-in calculator on the handle also.

Very slick, very nice, winner of Dutch and German design awards, comes with a six-month guarantee. Available from:

Run-Mate Instruments BV

Julianastraat 48

2405 CJ Alphen aan de Rijn

NETHERLANDS

Tel/fax: (31) 1720-72228

(Supplies, from page 10)

"And I want to put my two bits in about diffusion pumps. I recently hooked mine up and it sucks. And sucks and sucks and sucks.

"It was one of the best investments that I have made in my shop. I feel more comfortable with the work that I'm putting out now, as I know that the tubes are being filled hot and under five microns. And cool looking! The manifold, bombarder and pump itself looks insane enough but the diffusion pump looks absolutely wicked!

"My diffusion pump assembly cost me about \$175 in all, including oil, pyrex glasswork and hotplate. And did I mention that the pump used greaseless fittings?

"TRS Scientific Glass (6102 SW 163rd Pl., Beaverton OR 97007) has done numerous repairs on my manifold where I have broken it and I have always been very pleased with the results; they specialize in greaseless fittings. I asked for a catalog and have just about worn it out."

Andrew James at North Shore Neon in Vancouver BC also writes: "You guys are getting burned on diffusion pumps.

"Call Stan or Hope at Canadian Scientific Glassblowing (604-270-7466) and they will put together for you the most excellent diffusion pump (not aspirator) with any size chem-thread adaptors to fit your system for half the prices you've quoted.

"And with the exchange rate you Americans get an extra 20% off. Ask for the pump that Steve made for Andrew at North Shore Neon and they'll know.

"They also will fabricate anything from little mixing venturis to big wacking three-stage water-cooled diffusion pumps, and of course the nicest manifolds and components, all with chem-thread high-vacuum fittings."

(More bull, from page 14)

We also got some feedback on Joseph Keller's (NN #10) complaint about adjusting "screw-type" transformers from Neon Dynamics, which is one of the companies making this type of transformer.

Perhaps because R. Bruce Whitelaw, national sales director, had never heard of such a problem before -- yet assumed that it was his company's product being discussed -- he first asserted that the sign must have been inadequately cured in on the bench. Then he lamented that "Mr. Keller has had difficulty understanding the instructions on how to best utilize our power supplies."

He continues: "We have attempted to word these instructions simply and clearly so that even the most obstinate of benders will understand them." <The customer is always WHAT??>

When Ted wrote to remind Mr. Whitelaw that other transformers share this feature and that Keller's observation did not mention a manufacturer, Mr. Whitelaw complained that "this market is so 'aware' of developments that unsubstantiated rumors can sometimes cause great problems with a company's products."

So let us repeat: This was not an unsubstantiated rumor, but one person's experience. He did not name a manufacturer. We are here to serve benders and tell their stories, and we are also eager to correct errors and clarify points of contention. So we hope this makes everyone happy. OKAY??

Eurocom Imports Inc. writes: "Please know Eurocom has an exclusive agreement with Wagelaar Glasinstrumenten V.O.F. for all Eurovac manifold components for U.S.A. and Canada ... to offset and correct your suggestion <NN #9> to contact J.H. Ritmeester for these products." Eurocom's address is 10031 Monroe Drive #303, Dallas TX 75229; (214) 358-2400, (fax) 358-2215.

Another not-so-fine mess we've gotten ourselves into:

We received some long letters and various documents from Mark Snyder of Precision Neon Laboratories regarding our dutiful transmission last issue of Transco's statements.

We are stepping out of the whole mess by dutifully transmitting Snyder's statements that the "Ultra-Vac" trademark is his property and that his work for Transco was not a "joint venture."

We extend apologies to all parties, and condolences, and, most of all, our sincere regrets that we ever stepped into this free-fire zone.

We mean no harm, and we hate to print incorrect information. But given the limited time we can spend researching every seemingly innocuous claim by every company (and the high cost of trans-Atlantic communication), in most cases we must work with the info that we get, rather than faxing all possible interested parties for their comments, prices and current sales pitches.

Unlike broadcasters at election time, we are not required to (and wouldn't try to) provide any form of "equal time" for all companies: that would be mere advertising, and lousy reading at that. Maybe we should just never print a product name again: Snyder also insisted that every mention of his product be followed by that ugly little trademark symbol, but that's not our (typographical) style.

So, as we say in Hawaii: Sorry, eh, braddah?

Another unpleasantness: "Neon to Go" was true to its name -- it's gone (along with our \$30 to pay for its bad check). Neither mail requests to Tarpon Springs FL nor a phone message has helped. Other deadbeats (there have been several of you) can look forward to similar "advertising" if you don't make good on your bad checks to us. Sorry, but those bank charges bleed our printing fund...

(Edward, from page 11)



need another lawyer present, or a babbler fish. (A babbler fish is a fish you put in your ear so you can understand any language; read Douglas Adams for more on babbler fish.) But permits are a different game altogether...

If a customer requests a graphic or pictorial luminous tube project I sometimes show them an almost full-size layout, drawn in single-line pencil and highlighted with pastels. Pastels can represent most luminous tube colors fairly.

More on design: Brian has enough artwork on dinner napkins to feed Nikola Tesla many, many dinners. Ideas can hit at strange times. Last year I had a customer interested in some interior tubes to bring attention to his treadmills. While I was in his store, Aerosmith's song "Walk This Way" came on the radio.

I suggested using these words in the design, the owner liked it, and I got the order, so I guess it's safe to say that being receptive to your environment helps in design. Many times a word someone speaks or a perfume you smell while walking down the street can be transformed into a line drawing. Take everyday situations as inspiration...

Balance is a must in design. I remember one piece of advice I got years ago: After sketching your layout, imagine water running around your pencil lines. (If I had heard that during adolescence, I'm sure I would have said, "Yeah, RIGHT!") But you know, the water thing works.

In a sense, you're taking up empty space, but you have to realize that empty space doesn't mind being empty. So you have to be careful not to disrupt the empty space too much. Your design should share something with the space...

(Favor, from page 5)

another name. When I was traveling recently through L.A. I saw some signs that were exactly his style, and I thought "He was here, too!"

But even though I was out a couple of transformers and signs, not to mention the signs I still had in the shop, some of his sales techniques I've put to good use.

So in the end I figured it was about even. He got me for about \$700 worth of glass and transformers. Some of the glass that he never picked up I was able to sell on my own, and so I recovered some that way.

I had a sign that had a big fist with three white lightning bolts coming out of it; it said "comics." Now, I didn't think that I had much chance of selling that sign.

But one day when I was headed home from work I passed a comics store, so I made a mental note to put the sign in the back of my truck. The next day, when I stopped at the store with the sign and lit it up, the man who owned the store said "Ah, it's the Klor!" He obviously recognized the fist with the power bolts coming out of it.

And when I told him the price, and I agreed to give him a six-month warranty on the transformer, it was a sale.

He paid me the cabbage, and I left the shop smiling.

Extra! Extra! More bull from Bulletin Board

Regarding uncoated ruby red glass: Jed Schleissner (Oshkosh WI) tells of a bender who said "It's the iron oxide slowly degassing that causes them to go dim after they've been pumped. I bombard mine five times, and only then do they stay good."

Madonna is rumored to be pursuing the starring role in Night Angel, a film based on Kate Green's murder-mystery novel about a performance-artist-tubebender-witch (a job title we all deserve some days). A nod to the prescient Glantz catalogue folks for showing a Madonna pinup behind the Townsend manifold all these years. We'll forward all offers of neon technical training to Madonna via a friend who knows Kate...

Eric Rothwarf at Sky Neon in Philly joins in the groaning chorus of relief from rubber matting -- but he recommends TWO mats, not just one, for maximum comfort: "I wear good shoes, but that is not enough. I use two one-inch-thick rubber anti-fatigue mats, and now I can work for ten hours and not be tired when I leave the shop. You can buy these in most restaurant supply stores."

"The other suggestion I have has to do with bombarding. It has happened with me that often (especially with large units) it takes a long time for the unit to get to a low enough pressure for it to flash so that I can begin bombarding. This can be especially annoying, confusing and time-consuming. To avoid all this hassle, I hook my unit up to the manifold and leave it to be pumped down to a good vacuum (my metal manifold indicates vacuum). I go back to the bench and do a few more bends or whatever. When I see that the unit has pumped down, I go over and crack the air valve to let some air into the manifold and the unit. Then I start flashing. The unit usually comes down to pressure within a few seconds, and I am on my way to burning newsprint and cherry 'trodes. This has been a great discovery for me."

"Another thing I noticed recently is that stains will disappear if you heat them with a hand torch. I don't know how permanent a fix this is. I tried it on a sealed unit, but I would guess that you could try it with units on the bombarder. I do not like to bombard with natural gas, as I was told that this is extremely dangerous."

<As I understand it, one bombards with gas in order to dissipate the remaining mercury. Helium works pretty well for this -- not as well as gas (which I used to use) but it's much safer.>

More on staining from Becky Schuchert at Sparky's Neon Works in Steelton, PA: "Votarc's theories on mercury staining were very interesting but an 'old-timer' I had the good fortune to work with had another perspective on it."

"Ed Rollins of Reading, Pa., (no, not the former GOP campaign mastermind) was of the opinion that way-back-when the tubes didn't stain anything like they do now. He suggested that the glass companies are cutting corners and using cheaper chemicals to line the tubes. (Clearly some changes were necessary as some of the chemicals were carcinogens.) *<They still are: see NN#7>*."

"I am suspicious, though, when I hear stories like this: Richard Rosenkranz of Great Bend, PA (I didn't make that up), was having problems with NEON-filled CLEAR tubing turning black on the job within months. He looked closely at his tubing in the shop and discovered tiny web-like filaments throughout the entire box, which he believed to be the cause. He switched manufacturers and no longer has this problem."

"I currently rinse all my clear glass and ruby red before bending

it. Does *<a major glass company>* really expect us to rinse out our coated tubing after it's bent?! I had the president of *<another company>* tell me that once also. I was able to withhold my laughter until he left..."

Allan Chaudoin (Sepulveda CA) relayed another technique for stain removal:

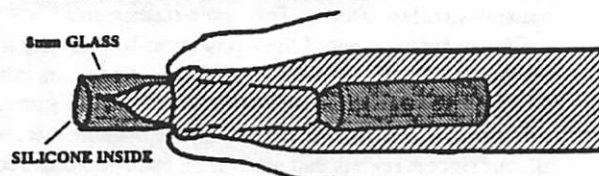
"To remove stains from a tube, first cut one electrode just behind the shell (leaving most of the electrode glass on). Then add a few tablespoons of triple-distilled white vinegar! Trickle it back and forth a few times and the stain will disappear. Then cut the other electrode and drain it out that end. Next flush it out with distilled water three times and dry it using the air from the shop blower. Install new electrodes after cutting off the remaining (old electrode) glass. Bombard as usual."

<Allan, retired now, had an interesting start in neon: In 1936 he was a theater projectionist and was frequently going to a neon shop to get glass repaired for the theater. Since he was working nights and had days free, the tubebender invited him to learn the trade....>

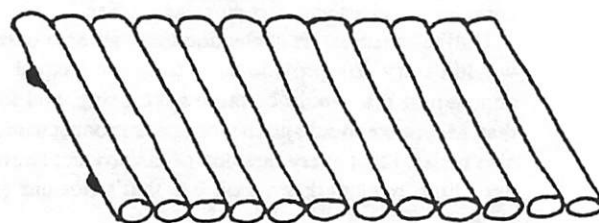
Candice Kling (Tampa/Amsterdam) relays the following repumping technique: "I had a job come back recently where they forgot to tell us one little thing -- the purple tubes were supposed to be filled with neon, not argon/mercury! I cut the 'trodes off, then connected a hose from the sink and gently ran hot water through them, so hot you couldn't touch the glass. Then I connected air from the shop blower to dry them, and with new 'trodes they pumped a beautiful red, not a trace of mercury! And no powder stripped out either."

Two fun things to do with silicone and glass:

1) Protective cap for tubulation tip (8mm clear glass). Keeps that "Achilles heel of neon" a little safer.



2) Scrap pads to lay the glass on when bombarding. The silicone beads run lengthwise underneath, to both hold it together and give it traction. Mica can be shoved vertically into the cracks, and will stay there (no more slipping away just as the glass gets hot).



To make curved, parallel lines for neon patterns most folks use "flexible rules," those overpriced stationer's items that seem to only come in sizes equal to 10mm and 12mm glass. To make your own try putting stiff copper wire inside rubber hose (the hose corresponding to the glass size) -- not as good as the real thing but pretty handy when you want, say, a pattern for 8mm or 15mm.

(see More bull, page 13)

For art's sake: You design it, we'll malign it

By Audie Foote

I've always been one of those guys who enjoys a good challenge, but unfortunately if you happen to make neon for a living, that "can-do" attitude can lead to occasional trouble.

I always wondered why a majority of older benders steered clear of neon "art" and off-the-wall glass projects, preferring to stick to commercial signage. Somewhere along the line they painfully learned that when you try to bring someone's creation to life via neon, you are treading in quicksand, with you not knowing what they expect and them not knowing what they're getting. And then you factor in the money (which is NEVER worth the work you put into it) and you're left with the age-old question, "Why? Why did I start this?"

A number of years ago I came up with a clever moniker for my business: "You write it -- We'll light it." Meaning of course that I could bend and light virtually anything you could draw or scribble.

Yeah. Right. Sure.

It almost sent my company into the Bermuda Triangle of Neon. The Black Hole of Benders. A vortex of sin and degradation, and... well, you get the idea. Some of the things I was asked (and attempted) to make could be summed up in one word, "verybizarre."

It began in earnest when a TV production company did a feature on my neon. It was really a great piece, with music and everything, and wound up going all over the country (was this my 15 minutes of fame Andy Warhol promised us all? I sure hope so). In the feature I bragged, "There's NOTHING I can't bend... You write it and, damn it, I'll light it!" Then, as Stephen King might say, "Slowly, imperceptibly at first, the nightmare began."

First thing Monday morning this guy parades into my shop saying he saw the show and that I was "far-out, man." Although he didn't necessarily look it, this guy was a throwback to 1969, the Woodstock era. His emotional development must have peaked back then, or just plain stopped.

He said, "I knew immediately you were the dude who was cosmically capable and worthy enough to make my neon masterpiece." Actually, he explained, it was a drawing based on a recurring flashback he had had for years, and "I think if I could see it come to life I could come to terms with its symbolism." (Isn't that what Dr. Frankenstein said?)

My first impression was to just humor the guy until I could usher him out the door before he had a violent episode or something, when suddenly he complicated things tremendously by pulling out of his leather scout satchel a wad of hundred-dollar bills, saying, "...and money's no problem." It took me four nanoseconds to reply, "Well, let's just see this drawing and see what we can do!"

It was the most god-awful drawing I'd ever seen in this or any previous life. He called it "Alien Roadkill," and I must admit it bore a striking resemblance to E.T. if a twelve-wheel semi reduced the middle half of him to tread. It was disgusting.

But looking back, I'd made disgusting neon before, though not intentionally. So I took the job. Who am I to be judgemental? Besides, there were at least twenty or thirty pictures of Ben Franklin sitting on the table offering true inspiration...

What a mistake! The guy drove me crazy. The job dragged on for months, it seemed, and when I had finally finished it, the guy came in loaded on who-knows-what and screamed when he saw it: "That's it! That's it! Uh, except can you turn it upside down, 'cause that's how I see it."

Then he sat in my shop for about two hours staring at it until I

started getting irritated, and then he announced he was "short on bread" and could I hold it for him until he could pay the balance due? Four months of staring at this monstrosity later, he finally comes up with half of what was owed, so I told him to take it out of my shop and never darken my door again, which luckily he didn't.

The lesson learned here was that I could have made three times as much money bending letters or commercial signage as I did wasting my time with this space case.

The problem was that I was deluged with unconventional requests

It was the most god-awful drawing I'd ever seen... But looking back, I'd made disgusting neon before, though not intentionally. So I took the job. Who am I to be judgmental?

following the TV show. An African American came into my shop with a picture of Lili Lakich's neon "Mona Lisa" and asked if I could do a similar rendition of his girlfriend's face, to be named "Winona Lisa" after her.

When we talked about what colors to use on the face, he got mad when I informed him that there was no brown neon.

So he said, "What about black?"

I sadly informed him that in the case of neon, black means an absence of light.

"Say, I heard there were 120 different colors of neon? And not one of them is brown?"

Nope, I told him, "but I do have one that is kind of a coffee color if viewed next to white; it's called 3500." So I lit up a sample, but he said, "That ain't coffee. That's saltine cracker." <Or did he say, "That's saltine, cracker"?-- ed.> Who'd have thought racism tainted the colorful world of neon?

Well, I wasn't lying about one thing: there's nothing I couldn't bend. But what price did I pay for dealing with the odd requests? Things out of the ordinary are certainly a challenge, but they also take much longer to make, use up all your good glass, and in general saddle you with people who have very little expertise in the field, which can sometimes be a problem.

But I've had my share of weird jobs from professionals too, like interior designers and some architects who think of themselves as "artists" and don't listen to advice.

One guy wanted a four-story-tall neon tower, free-standing of course, as the centerpiece for a mall. No visible structure to detract from its simplicity, no wiring showing, and, oh yes, he didn't like electrodes.

I said, "What else do you want?" and he replied, "It must be brown neon." Eat saltines, buddy.

Well, I learned my lesson. I still do some neon art and some strange jobs, but I don't advertise for them, and I choose my clients a bit more carefully.

And my moniker has changed. Now I say, "You design it -- We'll malign it!" Or, "You draw it -- we'll guffaw it!"

BULLETIN BOARD

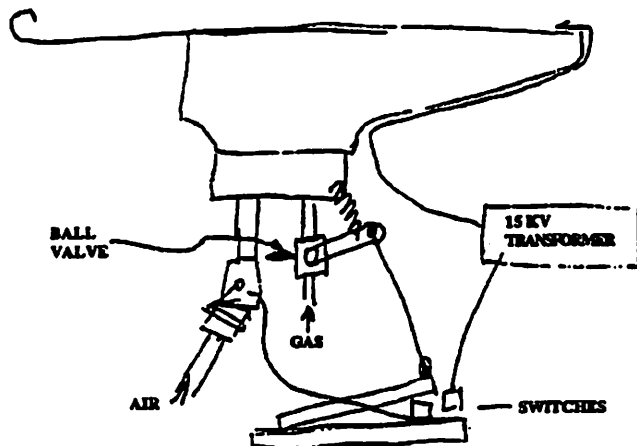
Pat Meyer of Custom Neon Designs in Wilmington DE is trying to start an association of neon tubebenders. (Yes! Yes! It's about time!)

She writes "The concept of the association is to create a non-profit educational platform, through local and national meetings, where tubebenders can learn a variety of techniques as well as keep current with product information from manufacturers. The association would create and maintain a current directory of tubebenders.

"I believe this organization can help further our efforts to create better products for our industry, lending our needs, complaints, and praise as a unified voice to the necessary places. This would in no manner act as a union, setting wages or fees, etc."

We broke our own rule and shared the Neon News mailing list with Pat. Anyone with time or energy to contribute toward organizing such a group can contact her c/o North American Tube Benders Association, P.O. Box 5303, Wilmington, DE 19808; phone/fax: (302) 888-2227.

Andrew James at North Shore Neon in Vancouver BC brings another interesting background to neon: "Being an ex-appliance repairman I've got all kinds of appliance parts operating in my shop. The most useful piece is a drain valve operated by a solenoid with a half-inch bore flap valve. It makes an excellent air valve for isolating your cross-fires or ribbon burner. Here's how my ribbon burner is set up:



"You'll find one of these valves on a newer-model Kitchenaid dishwasher (watch that you don't pull the fill valve)."

Mark Cherveney (Edmonton ALB) notes that "In <last issue's> article on how to adjust the ribbon burner 'economizer,' the 'oxygen inlet' mentioned is actually an outlet. I believe this is called a 'blow-by outlet.' If you experiment with it, you'll notice that:

"1. If you open the stopcock outlet and flip the economizer handle down ('normal' position) there will only be a trickle of air coming out of the stopcock.

"2) With the handle in the 'idle' position you get full-bore air coming out of the stopcock, unaffected by the pilot adjusting screw.

"This valve can be used as a poor substitute for a pressure regulator (but better than none at all). For this mode the stopcock is partly closed in order to keep up the air line pressure when idling. The two main problems with this system are the noise (from escaping air) and the other torches barely remaining lit while switching the economizer (must be quick or they will blow out)."

<This is the kind of tidbit that I find precious. I dropped Mark's letter to run over and test our ribbon burner - yee haw! thank you Mark. Six years of using Hydres and I finally know the proper setup.>

From Joe Augusta (both L.A. and San Francisco; he can't make up his mind): "Discovered a new surface for bending tables that rates a 10. It's plain old fireproof sheetrock, used in new buildings. It's cheap, doesn't burn, is smooth and is easy to cut to size. And you can draw pictures of where you'd rather be on it too!"

(see Bull, page 14)

ADS

Neon tubebender wanted. F/T position for quality-conscious person. Salary negotiable w/experience. Call (302) 888-2227.

Neon shop manager/glassbender sought by large Maryland sign shop. Contact Bob Wallace at Diehl Signs, 8325 Old Marlboro Pike, Upper Marlboro, MD 20772; phone (301) 420-6666, fax x0354.

Tube bender wanted for Neon Workshop Amsterdam. Minimum three years experience; salary negotiable. One-year contract includes airfare and help with housing. Fax resume to Ellen van der Schaaf, c/o Neon Workshop, Van Diemenstraat 368, 1013 CR Amsterdam, Netherlands; (3120) 626-3530; fax: (3120) 626-2789.

Neon Dynamics 3700 series power supply. All models, largest distributor, best pricing. Max Marketing-Neon. 19807 Sussex Dr., S.C.S., MI 48081. Call 24 hours: (313) 773-5000; fax (313) 772-6224.

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